FIVE YEAR
REVIEW REPORT (TYPE 1)

MEDLEY FARMS SITE
GAFFNEY, SOUTH CAROLINA

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PREPARED BY
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REGION 4

1.0 INTRODUCTION

EPA Region IV conducted this Five-Year review of the Medley Farms Site pursuant to CERCLA Section 121(c), NCP Section 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (dated May 23, 1991), and 9355.7-02A (dated July 26, 1994). This review is required by statute and is the first five-year review. The purpose of a five-year review is to ensure that a remedial action remains protective of human health and the environment and is functioning as designed. This document will become a part of the Site file.

1.1 Site Location and Description

The Medley Farm Site (the Site) occupies approximately seven acres of a 61.9-acre tract of land owned by Mr. Ralph Medley. The Site is located off Burnt Gin Road, about six miles south of the City of Gaffney. Land use in the Site vicinity is primarily agricultural and light residential. Until the early 1970s, the Medley property was maintained as woods and pasture land.

1.2 Site Characteristics

Residual soil at the Site is absent or occurs as a thin layer overlying saprolite. The saprolite is relatively thick across the Site, ranging from 50 to 70 feet thick near the former disposal areas to 7 to 28 feet along Jones Creek at the eastern boundary of the property. The saprolite consists predominantly of a silt with varying amounts of fine to coarse sand and clays. Underlying the saprolite is bedrock which consists primarily of a gneiss.

All groundwater in South Carolina is classified as Class GB Waters (South Carolina Regulation 61-68). This classification means that all groundwater meeting the definition of underground sources of drinking water (USDW) meet quality standards set forth in the State Primary Drinking Water Regulations (R.61-58.5). An USDW is defined as an aquifer or portion of an aquifer which supplies or contains sufficient quantity of water to supply a public supply system.

1.3 Site History

From approximately 1973 to 1978, several area textile, paint, and chemical manufacturing firms paid to dispose of their industrial wastes on the Medley property. The Site was first documented in 1981 when a firm disposing of wastes at the Site complied with the disposal notification requirements of CERCLA, reporting its use of the Medley Farm Site to EPA.

In May 1983, in response to a local citizen who witnessed the disposal of barrels on the Medley property, SCDHEC took samples at the Site and notified EPA of the presence of half-buried drums, many of which were leaking. That same month, EPA also investigated and sampled wastes, soil, and water at the Site.

EPA performed an emergency removal operation in June and July 1983. During this operation, EPA removed a total of 5,383 fifty-five-gallon drums and fifteen-gallon pails of waste, 2,132 cubic yards of refuse and contaminated soil, and 70,000 gallons of water and sludge from six

small waste lagoons on the Site. The lagoon areas were then backfilled and graded. Testing of the solid and liquid waste materials removed from the property indicated that the primary chemicals of concern were volatile organic compounds (VOCs). The Medley Farm Site was proposed for addition to the National Priority List (NPL) in June 1986. The Site was placed on the NPL in March 1990.

SCDHEC and EPA conducted several investigative studies on the Medley property from 1983 to 1984. These studies included the sampling of private wells in the Site vicinity, a geological study, more extensive groundwater sampling, and a preliminary investigation of Site hydrogeology. During this same period, EPA compliance staff also initiated investigations to identify individuals and firms responsible for the waste disposal activities. Over the following 2-1/2 years, EPA negotiated with several of the potentially responsible parties (PRPs) to investigate contamination at the Site.

In January 1988, five PRPs signed an Administrative Order on Consent (AOC) with EPA, in which they agreed to conduct an RI/FS of the Medley Farm Site. The PRPs hired Sirrine Environmental Consultants, an environmental engineering firm in Greenville, South Carolina, to develop Remedial Investigation (RI) and Feasibility Study (FS) work plans and other supporting documents for the RI and FS, as well as to perform the work outlined in these plans. The RI/FS began in late 1988 and was completed in early 1991. The RI/FS findings determined that the soil was contaminated with Volatile Organic Compounds (VOCs) in three primary areas. It was also determined that the groundwater was contaminated with VOCs. There are four contaminants of concern, 1,1-dichloroethene (1,1-DCE), Trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), and tetrachloroethene (PCE). After a Public Meeting in February 1991 in which EPA proposed their preferred cleanup option, and after receipt of public comments, EPA issued a Record of Decision (ROD) for the Site in May 1991.

Based on the Site RI/FS, the ROD for the Medley Farm Site presented the following selected remedy:

GROUNDWATER (Pump and Treat)

- Extraction of contaminated groundwater;
- On-site treatment of extracted groundwater via air stripping, with the need for controlling air stripper emissions to be evaluated in the remedial design;
- Off-site discharge of treated groundwater to Jones Creek via a National Pollution Discharge Elimination System (NPDES) permit; and
- Continued analytical monitoring of groundwater and surface water.

SOIL (Soil Vapor Extraction, or SVE)

- Installation of a network of air withdrawal (vacuum) wells in the unsaturated zone;
- Construction of a pump and manifold system of PVC pipes used for applying a vacuum on

the air extraction wells to remove the contaminants from the soil; and
- Use of an in-line vapor-phase carbon absorption system to trap and absorb the contaminants (organic vapors) out of the soil vapor, prior to its release to the atmosphere.

The remedy was modified in October 1993 by an Explanation of Significant Difference (ESD) issued by EPA Region IV. The ESD removed the requirement to treat SVE system emissions prior to discharge, based on air dispersion modeling conducted pursuant to State and Federal air quality regulations. Modeling of groundwater system air emissions also indicated that anticipated emission levels were well below those which could require a permit. Monitoring during both systems' startup operations supported and validated the modeling and the decision to issue the ESD.

The selected remedy established clean-up for contaminants in the groundwater based upon drinking water standards and for the soil based on preventing leaching of contaminants to groundwater from the soils. The goal of the selected remedy was to eliminate the principal threat posed to human health and the environment by preventing further migration of contaminants to the groundwater and by remediating the groundwater to drinking water standards.

2.0 DISCUSSION OF REMEDIAL OBJECTIVES

The remedial action objectives, as defined in the ROD, include the following: (1) eliminate or minimize the threat posed to public health and the environment from potential future exposure to hazardous substances in the soil and groundwater; and (2) restore contaminated groundwater to levels protective of human health and the environment.

2.1 ARAR Review

A review of current Federal and South Carolina drinking water regulations reveals the remedial goals for the contaminants of concern for groundwater, established in the ROD are the same as the current drinking water standards.

2.2 Remedy Implementation

In September 1993, EPA approved the remedial design for cleanup of the Medley Farm Site. The design included a two-armed array of 11 extraction (pumping) wells and associated pumps and pipelines which direct the extracted groundwater to a central air stripping unit. The pumps are "jet pumps" similar to those used in the wastewater industry, and have no moving parts. A low-profile air-stripping unit will accomplish removal of the VOCs from groundwater. After treatment, the water is discharged to Jones Creek under NPDES Permit No. SC0046469. The design also included an SVE system of 8 vapor extraction wells piped to a central vacuum apparatus, to remove VOCs from three main areas of soil contamination.

After an RA work-planning phase, onsite construction of the SVE and groundwater remediation

systems began on June 3, 1994. The majority of the construction work was completed by early December 1994. During the period December 1994 - early February 1995, punchlist items from the Prefinal (December 9, 1994) and Final (January 19, 1995) inspections were corrected, and both systems were initiated.

VOCs present in the vadose-zone soils were initially removed through a series of eight SVE wells. To enhance the recovery of soil vapors from the subsurface, an additional eight wells, which were originally installed as soil vapor monitoring wells, were connected to the vacuum extraction system in 1998.

Treatment system laboratory results indicate that both the SVE and groundwater treatment systems are properly achieving performance standards, and that the groundwater system effluent is meeting the levels established in the NPDES permit. The mass of the VOCs emitted to the atmosphere from the stripper and SVE unit fall well below the *de minimis* threshold of Regulation R.61-62.1. This was confirmed by a stack test performed in 1995. All performance verification data collected to date indicate that remedy components have been constructed in accordance with the specifications developed in the RD and RA phases. The monitoring wells located on the site are sampled regularly and they will continue to be until all the remedial goals for all contaminants are achieved.

2.3 Operation & Maintenance

The groundwater is in the process of being remediated. Several contaminants are still present above their remedial goals stated in the ROD. However, the concentrations of VOCs in the groundwater at the site have continued to decline.

SVE has been employed to remediate the unsaturated (vadose zone) soils in three areas as was designated in the ROD. These locations were selected as having the potential to provide long-term sources of VOCs to the groundwater. As of December 1998, an estimated total of 1900 pounds of VOCs have been recovered through SVE operations. Overall, the total rate of VOC recovery has decreased since startup. The current removal rate is estimated at 5.2 pounds of VOCs each year.

3.0 RECOMMENDATIONS

In order to better determine how effective the SVE system has been on treating the contaminated soils from the three previous source areas and in order to determine if the groundwater remains contaminated in these three areas, it is recommended that additional sampling be performed. This sampling will be performed later in 1999 by the responsible party, with EPA oversight. This will include the collection of additional soil samples from seven soil borings to be located in the three areas, as well as the collection of groundwater samples from these same borings.

4.0 STATEMENT OF PROTECTIVENESS

As discussed above, the Remedial Action at the Medley Farm Site as prescribed in the ROD for soils and groundwater are currently underway. Since the overall level of groundwater contamination has been decreasing since the signing of the ROD, it is believed that the Remedial Action at this Site is protective of human health and the environment. As described above, the effectiveness of the SVE system on soils will be determined later this year.

5.0 NEXT FIVE-YEAR REVIEW

Since ongoing remedial action has not achieved the cleanup standards set forth in the ROD for all the soil and groundwater, EPA guidance mandates that another five-year review will be conducted to evaluate the Site's status. Therefore, it will be necessary to re-evaluate the effectiveness of the remedy by July 2004.

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7/21/99
Date